Sample line member wearing the PICS suit.

Future Development

It is anticipated that future product enhancements will continue as the D&D technologies are deployed for new applications throughout the DOE complex and beyond. Operator feedback and product expansion into new areas will occur as additional opportunities to deploy technologies are identified.

Commercial Availability

The D&D technologies are commercially available through the following private sector partners:

- ***Petrogen, Inc.*** (Richmond, CA) provides the Oxy-Gasoline Cutting Torch, (510) 237-7274
- ***Delta Temax, Inc.*** (Pembroke, Ont. Canada) provides the PICS Coolsuit, (613) 735-3996
- ***Lucas Rescue Tools*** (Fredericksburgh, VA) provides the Hand-Held Shear, (540) 891-6600
- ***Pemberton*** (Orlando, FL) provides the Track-Mounted Shear head, (407) 856-4119
- ***BROKK N. America*** (Monroe, WA) provides the BROKK 250 system with concrete scabbler, grapple, hammer, and hydraulic shear, (360) 794-1277
- ***AIL Systems*** (Deer Park, NY) provides the Gamma Cam system, (516) 595-3782
- ***Science & Engineering Associates, Inc.*** (Albuquerque, NM) provides the Pipe Explorer system, (505) 884-2300

Contacts

John Trygier, DOE-FEMP, DOE D&D Program Manager, (513) 648-3154

Norm Pennington, FDF, FEMP D&D Project Manager, (513) 648-5141

Chelsea Hubbard, DOE-ID Project Manager, (208) 526-0645

Dick Meservey, LMITCO, INEEL D&D Project Manager, (208) 526-1834

T E C H N O L O G Y D E P L O Y M E N T

Integrated Decontamination and Decommissioning (ID&D)

September 1998

The Accelerated Site Technology Deployment Program (ASTD) funded 13 competitively selected projects in FY 1998. ASTD helps sponsor the deployment of available innovative technologies to provide valuable cost and performance data. ASTD helps eliminate perceived business risks associated with new technologies, encouraging rapid, multi-site deployment of cost-saving technologies. ID&D is one example of ASTD's success, where multiple sites are sharing lessons learned.

Problem

The DOE-EM D&D mission is to deactivate 7,000 contaminated buildings and decommission 700 contaminated buildings located at DOE sites throughout the U.S. It is also responsible for decontaminating the metal and concrete within those buildings and disposing of 180,000 metric tons of scrap metal.

Solution

Because of the large number of DOE buildings to be deactivated and decommissioned, innovative technologies that are faster or cheaper, could be deployed for considerable cost savings to the DOE. Portable hand-held shears, an oxy-gasoline cutting torch, a track-mounted shear, a personal ice cooling system (PICS) suit, a demolition robot with scabbler, hammer, grapple, bucket and hydraulic shears, a Gamma Cam radiation scanning device, and a Pipe Explorer gamma/visual inspection device have been proven to be a cost-effective, easy to use array of tools.

Status

The ASTD ID&D project for FY-98 focused on five miscellaneous small structures, located at the U. S. Department of Energy (DOE) Fernald Environmental Management Project (FEMP) in Fernald, Ohio. These structures are contaminated with a variety of hazardous and/or low-level radioactive materials. The Integrated Remedial Design/Remedial Action (RD/RA) Work Plan (DOE 1997a) for Operable Unit 3 (OU3) calls for these structures to be decontaminated and decommissioned in a manner as safe, cost effective, and timely as possible. Subsequent ID&D activities are scheduled to occur both at FEMP and the Idaho National Engineering and Environmental Laboratory (INEEL) in FY-99/00. Under the ASTD program, FEMP used a minority-owned small business (Wise Construction Services) to deploy D&D technologies that had been previously demonstrated by the D&D Focus Area.

Optimum Application

Innovative D&D technologies can be deployed as a suite of tools for the following applications:

- ➢ all concrete/metal building structures
- ➢ metal storage tanks and containers
- ➢ low-level radioactive contamination

Technology Limitations

The hand-held shear is limited in its application based on the thickness and type of material being cut. Typically, the hand-held shear is limited to cutting pipe and conduit less than two inches in diameter.

Baseline

The baseline D&D date for removal of these structures was originally planned for FY-99/00. Improvements of 1-2 years in the FEMP D&D baseline schedule are being realized as a result of the ASTD program.

Project Baseline Cost Vs. Cost Savings

The following table represents the initial savings derived from the deployment of innovative D&D technologies at three locations within FEMP.

Building/ Structure	Baseline Date	ASTD Date	Project Cost	Estimated Savings
38A	07/01/99	08/10/98	$135,000	$ 8,989
38B	07/01/99	08/15/98	$175,000	$ 2,486
24B	07/01/99	08/30/98	$ 72,200	$ 2,869

These three facilities were small, resulting in cost savings that are commensurate with the size of the building. Future deployment of these technologies at 23 larger FEMP structures are projected to result in a total cost savings of $7.8M over the course of the project.

Technology Description

The integrated D&D technologies deployed at FEMP and INEEL are being deployed as a total system to accommodate the many diverse applications for contaminated structures.

- ➢ BROKK 250 Demolition Robot with scabbler, hammer, grapple, bucket, and hydraulic shears – Used to perform a variety of D&D activities without exposing personnel to hazardous environments.
- ➢ Gamma Cam – Used as a radiation scanning device to assist in the characterization of buildings and structures prior to D&D.
- ➢ Hand-held Shear – Used to remove/size smaller pipes and other thin metal structures by an individual operator.
- ➢ Oxy-gasoline Cutting Torch – Used to cut through heavier metal structures or components such as tanks, beams, and panels that cannot be sheared using either the hand-held shear or larger shear/crusher tool.
- ➢ PICS Cool Suit – Used to increase stay times while preventing heat stress and improving worker comfort during D&D activities.
- ➢ Pipe Explorer – Used to identify radiation levels and pipe condition before dismantling piping structures.
- ➢ Tire or Track-Mounted Shear – Used for larger applications to dismantle concrete and/or steel buildings and structures.

Performance

The oxy-gasoline cutting torch was deployed at the FEMP buildings and at INEEL building CFA 691. The portable hand-held shears, a track-mounted shear and a personal ice-cooling system (PICS) suit were used to D&D three structures at FEMP.

FEMP building components 38A (Propane Storage), 38B (Cylinder Filling Station), and 24B (Railroad Engine House) were completely dismantled in August, 1998. FEMP building components 3F (Harshaw System) and 3G (Refrigeration Building) were dismantled in September, 1998.